

# ONTARIO FISH AND WILDLIFE REVIEW

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## THE COVER

Fishermen en route to their fish huts on Lake Simcoe, one of the most productive waters in southern Ontario. Close to heavily populated areas, Lake Simcoe provides excellent fishing for summer and winter enthusiasts. Photo by J.M. Main.

The price of beauty (Back Cover) was broken branches and fallen trees, following an unusually heavy coating of ice two winters ago. Photo of Southern Research Station at Maple by W.T. Masters.

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## EDITORIAL

An event of great significance in the history of Canada took place in Montreal during October. This was the Resources for Tomorrow Conference. For the first time in fifty years, recognized authorities in the various fields of resource management convened for discussion of their specialties. Over 600 people attended, and the conference continued for six days. Separate workshop sessions were convened on such subjects as Agriculture, Water, Forestry, Recreation, Fisheries and Wildlife, and discussions ranged through management, research, jurisdiction, administration and regional development.

On the proper management of these resources will depend, to a great extent, our employment opportunities, our standards of living, our recreational opportunities and the environment in which we live.

Our minds are occupied a great deal these days with international affairs, and the terrible possibilities which are continually discussed may obscure our thinking on other matters. It is probably true that the mismanagement of land and water and their products throughout history has caused far more human suffering and death than all the wars that have taken place since the beginning of mankind.

An important feature of the conference, and one that distinguished it from many resource conferences in Canada and elsewhere over the years, was the multiple-use approach to resource management. A conscious and successful effort to bring together the various disciplines in the study of single resource problems impressed many delegates and observers as being most significant. The cross fertilization of ideas accomplished by this process had application in research, administration, management, multiple-use land and water planning, and in many other fields.

Another important by-product of the conference was the production of two volumes of background papers. These will be supplemented by the published proceedings of the conference.

This opportunity to focus public attention on problems of resource management, and to provide a free exchange of views among authorities in all fields, is an important event. It means that the best opinions available in these fields are expressed and recorded for the guidance of those who are responsible for resource management policy. It means, as well, that a liaison system has been set up among the Government of Canada and the Governments of the Provinces and that this will be continued. The first step toward the solution of problems is recognizing that problems exist. No greater opportunity for the airing of views and problems arising in the fields of resource and land management has been presented in the history of our Nation.

# WINTER SPORT FISHING IN ONTARIO

by G.C. Armstrong

*Supervisor, Game Fish and Hatchery Section*

Ice fishing is one of the most popular forms of outdoor winter sport in Ontario. During the past decade, public interest in ice fishing has increased tremendously and the sport, which was previously confined mainly to Lake Simcoe and Lake Erie areas, has now spread throughout most of the province.

The total number of anglers participating in the sport is not known since resident angling licences are not required in Ontario, except in Provincial Parks. However, on the basis of fairly extensive field observations, it is estimated that more than 100,000 anglers probably took part in ice fishing in 1961.

Ice fishing in Ontario originated with the native Indians. Dr. H. R. McCrimmon in his book, *Fishing in Lake Simcoe*, gives an excellent account of the early history of winter fishing on Lake Simcoe. He notes how adept the Ojibway Indians were at spearing fish through small holes cut in the ice and how the technique was adopted by the first white settlers. Also: Dr. K. H. Doan, reporting on winter fishing in western Lake Erie, relates how the earliest fur traders and settlers, operating from islands, fished through the ice for jumbo herring with baited hook and line.

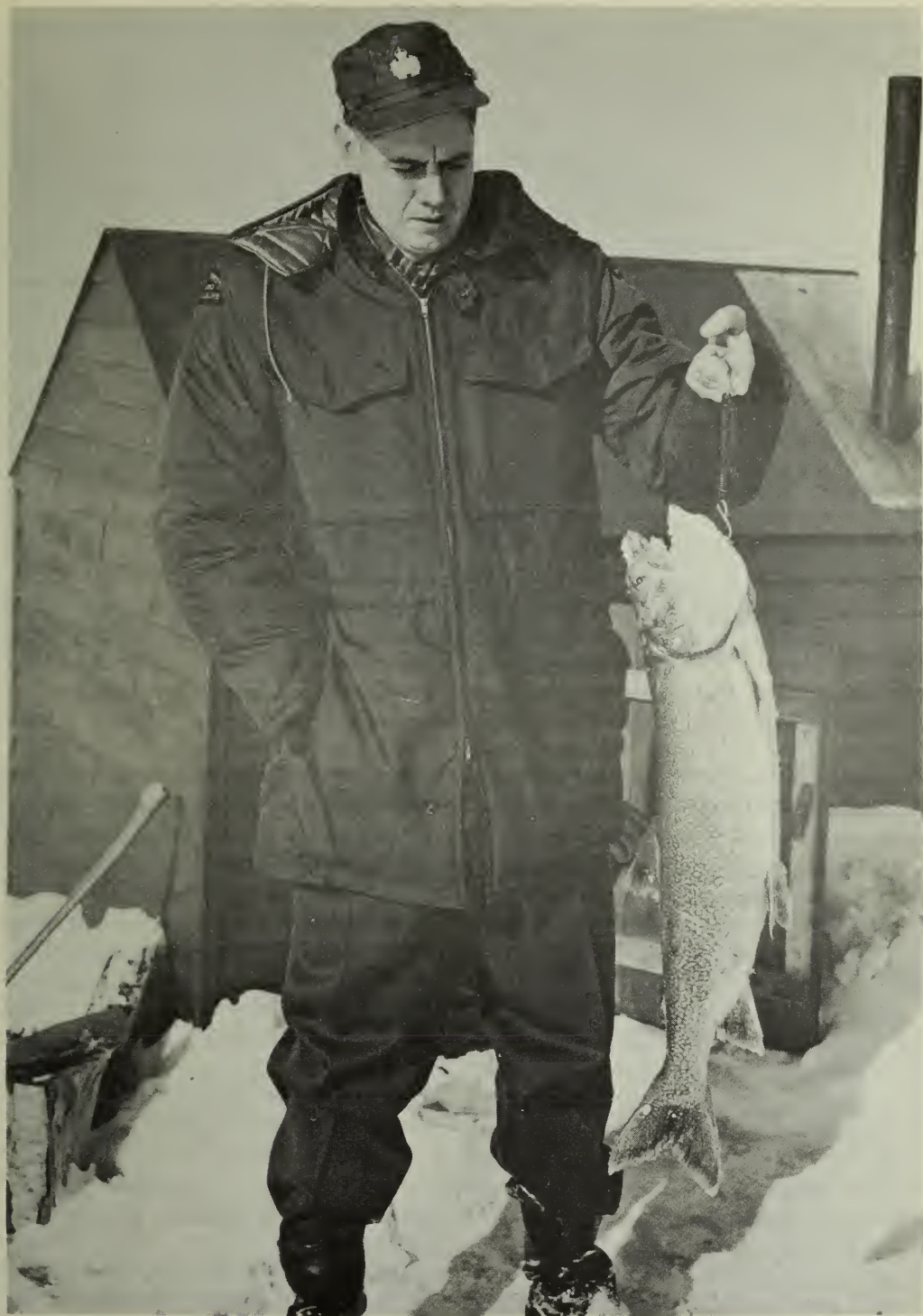
Most of the ice fishing during the early days was primarily for food. Fish were also sold or bartered when markets were available but it was near the turn of the century before sales reached commercial significance. About this time, fish huts or fish shanties came into being. Previously, most winter fishermen confined their activities to the more sheltered areas of the lakes or used make-shift shelters with blankets

and poles for protection against the weather. However, with the advent of the fish hut, more people became interested, and the fishery expanded in scope and in production.

Subsequently, between 1900 and the end of the second World War, ice fishing in Ontario was for the most part confined to commercial operations. Winter fisheries involving the use of gill nets and some impounding gear were developed on each of the Great Lakes and on a number of the larger inland lakes, particularly in the northern part of the province. Winter angling was continued on Lake Simcoe and on Lake Erie and connecting Great Lakes waters to a modest degree, but no appreciable interest in the sport fishery was evident elsewhere.

Following the War, a new era began for fisheries in Ontario. One of the important developments was the increase in public interest in ice fishing. Initially, most of the attention was directed to the established sport fisheries on Lake Simcoe and Lake Erie waters, but soon afterwards the interest began to spread to other areas and eventually to cover most of the settled districts.

A number of reasons may be cited as influencing factors in this development. Shorter working hours, better roads, increased travel and the increased amount of time devoted to outdoor recreation undoubtedly all played an important role. Another principal reason for the more recent increase in ice fishing activity on inland waters was the liberalization of fishing regulations. Two important changes in the Ontario Fishery Regulations which greatly influenced winter angling were the establishment



*The lake trout is a highly prized species which attracts many winter anglers in Ontario. Photo by R. Muckleston.*



*A Conservation Officer checks ice fishing on Lake Simcoe. At the rear is his snowmobile. Photo by J.M. Main.*

of a winter season for lake trout fishing in a number of areas in 1957, and the extension of the walleye (yellow pickerel) season which provided for winter fishing in southern Ontario waters in 1960 (except in Algonquin Park and the counties of Peterborough, Northumberland, Durham and Victoria).

Currently, winter angling is mainly concentrated in Lake Simcoe and Lake Erie areas. Considerable activity is also seen in the more settled areas of districts bordering on the other Great Lakes and in the southern part of the Kenora region. Some activity is also evident in the more northern districts, but the degree of development in these areas is limited, partly because of the sparse population and partly because of the more extreme climatic conditions.

In addition to the angling fishery, more than 150 commercial fishermen are

licensed to conduct winter fishing operations. The majority of these operations are carried out on Lake Ontario and on the larger inland lakes in northern Ontario. Most of the licences are issued for the harvest of commercial fish species; a few are also issued for the taking of coarse fish. Gill netting is the common gear used although some impounding equipment (i.e., hoop and trap nets) is also licensed for use in the eastern part of Lake Ontario and in Lake St. Clair.

One of the most significant developments in the winter fishery has been the continual expansion on Lake Simcoe. In this area, fish huts are used almost exclusively by anglers. A count of the number of huts therefore provides a reasonably accurate index of the size of the fishery. In 1950, approximately 800



*An example of the temporary shelters used by ice fishermen on some of the inland lakes.*

fish huts were counted on the lake during the peak of the ice fishing season. In 1961, an aerial census conducted in February revealed a record total of 4,146 huts or slightly more than a fivefold increase.

Although the number of huts does not necessarily reflect the number of anglers on the lake, it would appear from creel census studies conducted on Lake Simcoe that the relationship is reasonably comparable and that the number of anglers participating in the fishery is generally proportional to the number of huts. If this assumption is acceptable, it can therefore be estimated from the creel census data obtained during the current year that some 80,000 fishermen fished on Lake Simcoe during the 63-day census in 1961 as compared with an estimated 15,500 fishermen during a similar period in 1950.

Other creel census data obtained from the Lake Simcoe study revealed that an average of 1.6 fish were caught per angler, and that 2.1 man-hours fishing were required per fish. The total harvest taken from January 15th to March 18th was estimated at 129,380 fish. The species caught and the estimated catch of each was as follows: perch (48,370), whitefish (45,280), herring (31,200), lake trout (3,250) and burbot (1,280).

The status of the ice fishery in Lake Erie District can best be described by review of the District annual report. Results from creel census studies conducted on five principal ice fishing areas (Upper Niagara River, Long Point Bay, Rondeau Bay, Western Lake Erie and Upper Lake St. Clair) in 1960 showed that some 56,000 anglers, including 15,500 non-residents, caught an es-



*Conservation Officers check the catch on Lake Simcoe. Photo by R. Muckleston.*

timated 2,500,000 fish. This catch consisted largely of perch (1,843,500) and smelt (671,700) with the latter species being taken mainly in the Niagara River.

The results from similar studies

conducted in Lake Erie District in 1961 showed a general increase in the fishing activity in most areas, notably in the western part of Lake Erie and in the Detroit River and lower Lake St. Clair. Perch and smelt continued to be the

dominant species but excellent catches of walleye were also taken in the Detroit River and lower Lake St. Clair area.

Elsewhere in the province, the winter sport fishery is much more scattered and variable. Public interest is directed mainly toward the harvest of lake trout. Walleye and pike fishing are popular in some areas, particularly in the southeastern part of the province, in the Muskoka area and in northwestern Ontario. Whitefish and herring, although popular species in the Lake Simcoe fishery, do not attract much interest or attention from fishermen in other areas of the province at the present time. However, one or both of these species are taken incidentally in most winter fishing, and it is expected that these fish will become increasingly popular as the sport develops.

Ice fishing in the majority of inland lakes is still very much in its infancy by comparison with the long established operations on Lake Simcoe or in the Lake Erie area. The fishery on most inland lakes presently lacks the experience and organization of the established operations. Fishing is conducted in a much more casual and irregular manner and is usually confined mainly to week-ends and holidays when snow and weather conditions are suitable for convenient travel.

The success of the winter sport fishery in inland waters varies tremendously. The results from extensive creel census studies conducted on most of the more popular fishing waters show the fishing pressure on most species to be generally light. However, consid-

erable pressure is being exerted on the lake trout in some areas. This fishery is particularly vulnerable to over-fishing because of the slow rate of growth of the lake trout and because of the relatively low productivity exhibited by the species (it is generally considered to be about  $\frac{1}{2}$  pound per acre per year for most Ontario waters).

Special attention is therefore required to ensure proper management of the lake trout fishery. Certain restrictive measures have already been required in some areas in recent years. The creel limit for the species has been reduced on Lake Simcoe from five to two fish per day since 1956, and on Lake Temagami and southern Ontario waters from five to three fish per day since 1960. Further regulatory control may be necessary for the protection of lake trout if the winter harvest of this species continues to increase in the more heavily fished areas.

In summary, then, it may be stated that ice fishing in Ontario is fast developing as a popular winter sport and as an important industry. Although the present fishery is centered mainly on Lake Simcoe and in the Lake Erie area, there is also an extensive increase in the more heavily populated areas. Some concern is expressed about the future of the winter fishery for lake trout in some areas, but otherwise the potential of the industry is relatively unrestricted. It is expected that public interest will continue to increase and that the fishery will continue to expand and spread, particularly in the vicinity of the more settled areas.

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# AERIAL CENSUS OF WOODLAND CARIBOU (*Rangifer tarandus*) IN THE ATTAWAPISKAT--WUNNUMMIN REGION, 1961

by John Goddard  
District Biologist, Geraldton

The purpose of this study was fourfold:

(1) To attempt to develop a technique for woodland caribou inventory that would provide an estimate of total numbers of this mammal in various zones of its winter habitat in Ontario.

(2) To make a brief ecological description of winter habitat in which caribou herds were observed.

(3) To determine distribution and relative densities of woodland caribou in the Attawapiskat - Wunnummin region. As a broad ecological zone, this might be considered as part of the eastern swamp region of northern Ontario.

(4) To attempt to determine age ratios and sex composition of observed woodland caribou herds.

The field work was carried out between January 31 and February 14 from Lansdown House on Lake Attawapiskat.

I should like to thank Father Maurice Ouimet and Brother Raoul Bernier of Les Missionnaires Oblats de Marie Immaculee at Lansdowne House who helped in moving food and gear in their bombardier in -25°F weather, and offered splendid hospitality in their home to the twelve members of the field party.

A study area was chosen in part of the eastern swamp region centered on Lansdowne House. The region covered an area between longitude 85° 40' W and 91° 00' W. Latitudinal boundaries of the surveyed area were 52° 00' N and 54° 00' N. Approximately 4,100 square miles were actually examined. This was a 14.5 per cent sample of the study area.

The total area contained a variety of timber types and topography but large

areas were remarkably uniform. Vast areas were covered by old burns, especially the portion between Mameigwess, Wunnummin, Big Trout and Shibogama Lakes. Thousands of acres of timber have been destroyed by fire in this area. Other areas are covered by solid blocks of black spruce, with jack pine on the bluffs and higher ground. Hardwoods are rare, except on the burnt areas. The eastern part of the study area might well be described as "islands of black spruce in a sea of swamp". Other areas consisted of irregular patterns of black spruce and tamarack, with numerous clearings. The "ring and oval" formation actually consisted of black spruce surrounding boggy, shallow lakes or swamps in early stages of plant succession. Tamarack swamps often occurred in the vicinity of these rings of black spruce. The forest is never thick and continuous in this zone. Approximately 80 per cent of woodland caribou herds seen were found in this characteristic black spruce - tamarack community.

Within this assemblage of cover types, woodland caribou appeared to be selective in their choice of winter habitat. On the basis of track evidence, vast areas of apparently suitable terrain are completely ignored by woodland caribou. Whether this distribution is caused by competition among the caribou or whether they require a specific type of winter

*Woodland caribou were invariably located in the kind of habitat shown right. Note the rings, ovals and clumps of black spruce. Top photo by W. Masters; bottom by H. Kodila.*



habitat, I do not know. Populations of moose were often observed in areas where caribou sign was seen, and the trampling of lichens by moose may be a factor, but I doubt it.

It appears from track evidence that caribou require relatively large, continuous areas of uniform range. They were never observed on burnt areas which is not unusual. However, if large areas of suitable caribou range had been destroyed by fire, resulting in islands of good caribou range surrounded by burns, the archipelago of "good" areas did not appear to attract caribou. Whether this fragmentation is caused by fire, topography (e.g., a jack pine ridge), or a geographic accident such as a large meandering river, all factors favouring fragmentation of suitable habitat seem to discourage caribou from inhabiting the range.

## METHOD OF SURVEY

Fifty-five parallel flight lines were drawn on maps at four-mile intervals. Two Beaver aircraft, operating from Lansdowne House, were used to survey these strips. Each aircraft carried two observers and a navigator who also observed at certain periods.

The survey was carried out from 700 to 800 feet above the flight lines. Air speed was usually 100 m.p.h. but varied between 100 and 110 m.p.h. The strip observed on either side of the aircraft was 1,600 feet and 2,400 feet, depending on cover type. In denser cover, the narrow strip was surveyed, while in open areas the wider strip was practical.

The following information was recorded for each strip flown:—

(a) Strip data—including date, strip width, strip length, general description of topography and cover. All strips were flown in a north-south direction.

(b) Crew data.

(c) Navigation records—including air speed, altitude, time survey commenced and time completed, number of minutes spent searching, and the number of circles made of suspected caribou concentrations. The average duration of circling was also calculated. To map observations with reasonable accuracy, a timing system was employed. The navigator would mark on his map the time when the aircraft passed over certain features on the ground such as lakes and streams. The observers recorded the time and details of their observations. By referring to the time on the navigator's map it was possible to calculate the position of each observation. All watches, including the aircraft clock, were synchronized before take off. To keep the time system accurate, it was necessary for the navigator to record location of circling and the total duration of each circle on the strip. We had little difficulty in navigating although travel was more difficult when features on the ground were not marked on the map. The outline of lakes was fairly easy to determine but required almost constant attention to the map. In the swamp region, only relatively large lakes were shown on the map and small lakes were not charted at all.

(d) Meteorological records.

(e) Number of caribou seen—

(1) On the strip; (2) Off the strip. Each caribou was recorded as antlered, bald-headed, a calf or unknown.

(f) Number of moose seen—classified as bulls, cows, calves or unknown.

(g) A brief description of habitat and topography in which caribou were observed.

(h) Remarks on relative track densities, reaction of observed caribou herds to the aircraft, and observation of tracks or sight records of birds and mammals other than moose or caribou.

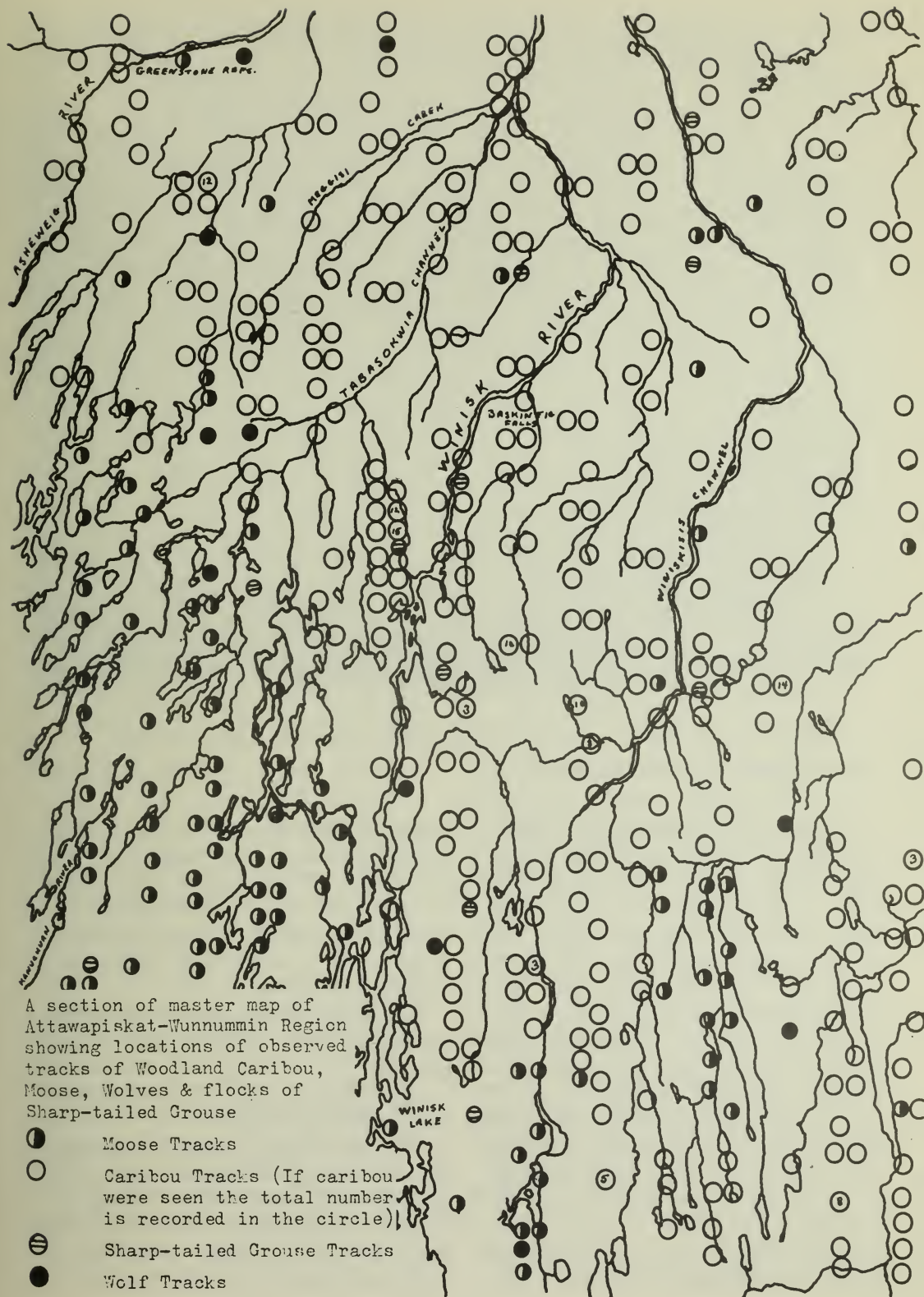


Table I - Table summarizing data on woodland caribou herds in the Attawapiskat - Wunnummin region.

Herd No.	Date	Antlered	Bald-Headed	Calves	Unknown	Total
1	Feb. 8	3	4	4		11
2	Feb. 11		2			2
3	Feb. 6	3	6	3		12
4	Feb. 5	2	7	3		12
5	Feb. 5		2	1		3
6	Feb. 5	3	5	2		10
7	Feb. 5		2	1		3
8	Feb. 5	1	5		4	10
9	Feb. 5	3	3	2		8
10	Feb. 6	6	5	3		14
11	Feb. 5		3			3
12	Feb. 1		1			1
13	Feb. 3		5			5
14	Feb. 3	6	2			8
15	Feb. 2		1			1
16	Feb. 1	1	1			2
17	Feb. 5				6*	6
Total number		28	54	19	10	111
Total approximate percentages		25%	50.5%	17.5%	9%	100%

\* These six animals were sighted in relatively heavy timber and the observers were unable to classify the animals.

According to Hall and Kelson (1959), male woodland caribou shed their antlers shortly after the rut in September and October, but females do not lose their antlers until the calving season. If this is a general rule, Table II might be constructed showing approximate sex and age ratios. However, in Ontario it is probable that a few cows never grow antlers and this fact should be considered in interpreting the data.

If Hall and Kelson's rule is true, the following conclusions may be drawn:-

(1) Relatively small herds (average of 2.5 animals) are made up entirely of males.

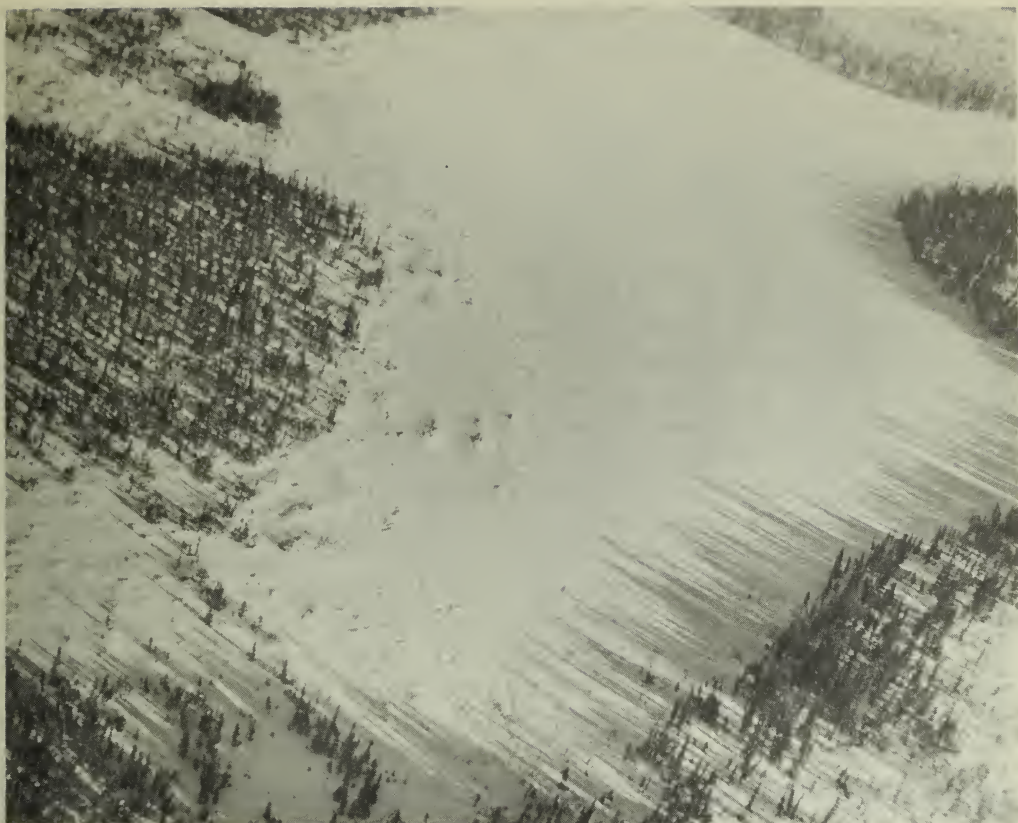
(2) Excluding the unidentified animals, calves appear to make up 19 per

cent of the total observed; males, 54 per cent; and females, 28 per cent. These percentages are almost an exact reverse of sex ratios normally associated with polygamous mammals. Some of those assumed to be bulls may have been bald-headed cows.

(3) Where calves were present in the herd, they made up 27 per cent of the total.

(4) Fifty per cent of the observed herds contained calves.

(5) The average number of caribou in a herd was 6.5 animals (based on a sample of seventeen herds). During the survey, two bush pilots (not our pilots) reported two large caribou herds, one of 35 animals and one of 22 animals.



*Photo by C. J. Kirk shows the typical cob-web pattern made by two caribou.*

#### COMMENTS ON THE CENSUS METHOD

(1) In strip flying, between 700 and 800 feet is considered to be the best altitude for observing woodland caribou. Below 700 feet at a speed of 100 m.p.h., the observer cannot adequately search a strip width of 1,600 feet.

(2) 1,600 feet is a maximum strip width to sample in timbered areas. In open swamps, caribou are relatively easy to see, even with a strip width of 2,400 feet. In heavy timber, it is not easy to spot even moose unless the observer's eyes are vertically over the animal. However, judging by the virtual absence of tracks in this timber type, it seems doubtful if caribou use this habitat.

(3) During the survey period, 0.1

inches of snow fell at Lansdowne. We experienced eleven consecutive days of brilliant sunshine which seemed to be ideal weather for spotting caribou. Not much snow had fallen at Lansdowne House since January 16th, 1961. Although this did not aid in the distinction between old and fresh tracks, it did help in the determination of distribution of moose and caribou. A heavy snowfall would have covered up old tracks and might have led to some erroneous conclusions concerning distribution of big game. There was a tremendous variation in temperature at Lansdowne House during the study period. Temperature varied in ninety-six hours, from - 55° F at night to +45° F at 2:00 p.m., a variation of 100° F in a very short time.

(4) If the observers were uncertain

Table II - Percentages of males, females, and calves in caribou herds.

Herd No.	Males	Females	Calves	Unknown	Total
1	36.4	27.2	36.4		11
2	100				2
3	50	25	25		12
4	58.3	16.7	25		12
5	66.6		33.3		3
6	50	30	20		10
7	66.6		33.3		3
8	50	10		40	10
9	37.5	37.5	25		8
10	35.7	42.8	21.4		14
11	100				3
12	100				1
13	100				5
14	25	75			8
15	100				1
16	50	50			2
17				100	6
					111

of identification of tracks made by moose or caribou, these tracks were recorded as "unknown". Caribou and moose tracks are not difficult to distinguish except in the case of single caribou that have been on the move. Caribou concentration areas appear in the snow as cob-web patterns. Where the caribou have been travelling (sometimes in single file) the web is not evident.

Tracks of moose, wolf, otter, fox, lynx and other mammals were noted. Bird-sight records included large numbers of sharp-tailed grouse, ptarmigan, snowy owl and raven.

(5) In early February, the best time to observe caribou is between 10:15 a.m. and 3:15 p.m. at this latitude. Before or after these times, the shadows of the trees are at an angle of  $45^{\circ}$  or even

approaching a right angle at 4:30 p.m. Also, before or after these times, the shadows of the trees are larger, making animals harder to see. In strip flying, not more than  $4\frac{1}{2}$  hours is recommended for searching in one day. Glare from the snow and the motion of the aircraft produces mental and physical fatigue which affects the quality of observations.

(6) At the conclusion of the strips, a plot was surveyed by circling. I believe this method is good where there are heavy concentrations of caribou. The choice between strip flying and searching plots depends on the purpose of the study. If the study is to determine distribution of caribou, then the strip method is probably the best. To determine total caribou numbers, searching plots would be desirable.

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# HUNGARIAN PARTRIDGES IN KEMPTVILLE DISTRICT

by J.B. Dawson  
*District Biologist, Kemptville*

The following report summarizes available Hungarian partridge information for the period, January 1, 1960, to January 31, 1961. Although some of the following information has been summarized in previous reports, references will be made to data collected prior to 1960 for purposes of comparison.

Although the winter of 1959-60, was fairly severe with deep snow and low temperatures, partridges wintered well, and an excellent breeding stock appeared to be present as late as March, 1960.

Subsequent weather across the main partridge range was poor, especially in May when heavy rainfall occurred early in the month; this was followed by unseasonably low temperatures. Chick and egg mortality no doubt caused the lower-than-average covey size noted this fall; average covey size was also influenced by a greater percentage of renesting this year. Hunting pressure was the heaviest we have seen. A few of the smaller coveys were considerably reduced in size but our December census

turned up some surprisingly strong coveys. It appeared that a good many coveys were not shot over at all. However, a larger sample of birds observed in January indicated that coveys were significantly smaller than usual.

Our December and January census gives a good idea of partridge mortality during the hunting season. Later counts indicate progressive reduction in covey size throughout the winter months and show the effects of weather, predation and other factors on survival, as well as the potential spring breeding population.

Pre-season coveys in 1960 were the smallest on record, averaging only 11.4 birds. December counts are too few to be reliable, but the large January sample shows a reduction of only 25 per cent from the pre-season average. This may represent actual conditions, but it is possible that very small coveys have joined forces, masking actual mortality from September to January.

Although December data are meagre, they do suggest that about 25 per cent

Table I: Covey Shrinkage Through the Fall and Winter. Bracketed numbers show the number of coveys checked in the sample.

Year	Sept.-Oct.	December	January	February
1951-2	12.7 (30)*	9.7 (16)	7.9 (12)	-
1957-8	16.2 (33)	-	10.4 (33)	9.6 (44)
1958-9	15.3 (21)	11.1 (33)	10.5 (49)	9.1 (42)
1959-60	15.5 (42)	-	9.9 (63)	8.9 (32)
1960-1	11.4 (36)	11.4 ( 9)	8.5 (63)	-

\* Census conducted in September and first few days of October. Only unshot coveys recorded.

Table II: Summary of Nesting Data, Kemptville District

Area	Year	No. Eggs	Location of Nest	Remarks
Alexandria	1958	16	Roadside Grass	Hatched July 5.
Brinston	1958	21	Hayfield near edge.	Nest mowed over. Deserted.
Winchester Springs	1959	21	Hayfield	Eggs pipping June 28, Hen killed by mower. All lost.
Ingleside	1959	23	Roadside Grass	Full clutch on May 28. Mowing caused desertion.
Munster	1959	17	Hayfield 10' from fence	Embryo 7 days old on July 3/59, Hen incubated, but predator destroyed nest.
Brinston	1959	18	Hayfield near edge	Mowed over nest. Hen killed.
Alma	1960	22	Directly under page wire fence in grass.	20 hatched June 29.
Ingleside	1960	19	Roadside Grass	13 hatched last week in June.
Ingleside	1960	14	Open grass, 40 ft. from road. Near small tree.	All hatched - time unknown.

Table III: Hungarian Partridge Hunting Success

<u>Year</u>	<u>No. Gun-days</u>	<u>Birds Taken</u>	<u>Birds/Gun-Day</u>
1956	12	35	2.9
1957	56	188	3.3
1958	40	146	3.6
1959	77	371	4.8
1960	194	747	3.9

The Hungarian partridge lays an average of about 16 eggs per clutch, almost always in stands of grasses or clover (right). Plastic tags (below) have proved very effective in the study of partridge movements and behaviour. These birds grow quickly and become too wild to hunt successfully late in the fall. Bottom: a covey feeding on green grass and grit bared by a snow plow, a common winter scene in eastern Ontario. Photos by J.B. Dawson



of the pre-season population is lost by late December, about 35 per cent by mid-January and about 40 per cent by mid-February.

Since figures on monthly covey size are averages of counts taken during each month, coveys would be somewhat smaller at the end of each month than is indicated in Table 1. By the end of February, the average covey contains closer to eight birds, and the reduction from the pre-season population would approach 45 per cent on an annual basis.

We were surprised at the remarkable similarity in average covey size for the month of February even when substantial differences in average fall covey size occurred. This suggests that fall and winter losses may depend upon population density, being highest in years of high population.

The winters of 1958-59 and 1959-60 were very severe, with deep snow and periods of extremely low temperature. We have seen no evidence that normal winter weather has seriously affected partridge populations, provided sleet storms do not occur, and in good range the birds withstand extreme weather very well. We consider that a very good partridge population survived to late February and early March, 1960. At



Table IV: Age Ratios of Hungarian Partridges in Hunters' Bags

Year	Total Birds	Juv/ Adult	Juv/ Adult Female
1950	140	4.84	8.92:1
1951	169	4.28	13.70:1
1952	153	3.02	11.50:1
1953	252	1.65	3.48:1
1954	213	3.01	8.00:1
1955	12	5.00	5.00:1
1956	35	1.91	5.75:1
1957	140	6.00	13.33:1
1958	209	3.89	11.00:1
1959	466	5.13	11.10:1
1960	623	2.64	6.45:1
Average 10 years		3.53	8.47:1

this time, coveys break up and pairs become very secretive.

Although snow was deep, partridges were difficult to trap in 1960, and considerable effort was required to catch the 50 birds which were sent to Elgin County. Intermittent mild weather seemed to affect trapping results, and it may be that continuing cold weather is needed to trap partridges successfully.

Our wire "funnel" traps were modified last winter. A "trap door" type, operated with a propped stick and pull-string, appeared to work better under certain conditions; this type of trap catches the complete covey more frequently than does the "funnel" type.

The main nesting period was considerably later than in 1959 but only slightly later than the long-term average. Figure 1 indicates graphically the main peak of the hatch for the past three years. Date of hatch was calculated from the state of development of the primary feathers taken from wings supplied by sportsmen.

A warm, sunny April was followed by cool, wet weather in May and, although little rain of any consequence

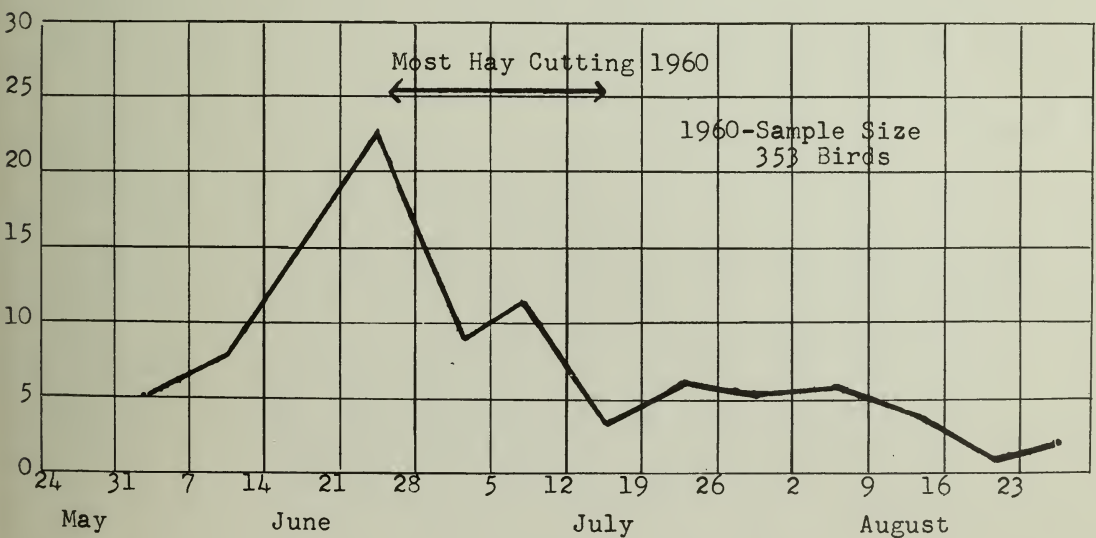
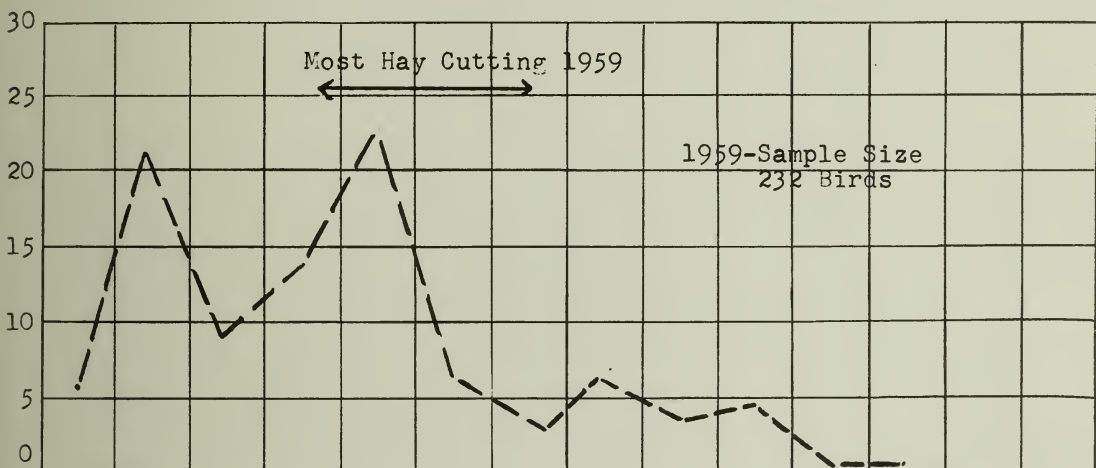
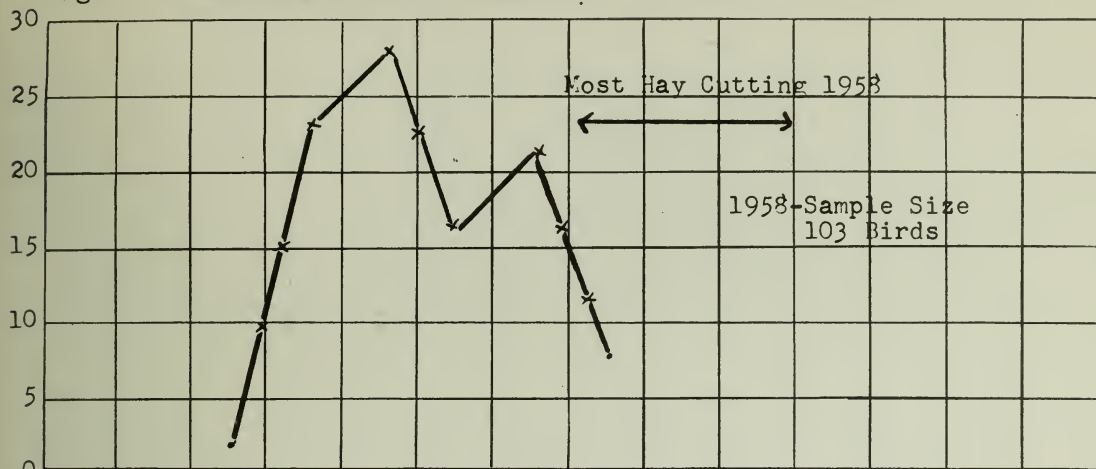
fell in June, temperatures during both months were below normal. This, we believe, resulted in an abnormally high loss of initial nesting attempts and an increase in renesting.

Sixty-four of 353 birds were hatched after July 26. These birds are the product of a second nesting, indicating a renesting figure of 18 per cent. This compares with an eight-year average of 8.5 per cent. It was evident during the open season that an unusually large percentage of very young birds was present: by far the greatest number we have seen.

For the second year, a special effort was made to locate partridge nests. In the summer of 1959, two men searched for nests for over one week in late May and early June. Several methods were tried, including dragging a nylon rope with tin cans containing rattling stones across grassy cover. No nests were located during the intensive searches. As has been demonstrated on several occasions, hen partridges sit very tightly and are difficult to flush.

Several sources state that hens flush more readily in the early stages of incubation, but this has not been

Fig. 1 - Hatching Dates of Hungarian Partridge - from Wing Moults Data



borne out in two instances. A tractor mowing hay on July 3, 1959, straddled a hen partridge before she flushed. One egg was taken from the nest and inspection showed that the embryo was in the 7th day of development. The next day, I touched the hen with my hand before she flushed. In June, 1960, a farmer repairing a fence stepped on an incubating hen partridge. The hen escaped without injury and an egg taken from the nest was found to be in the 5th day of incubation.

Very few nests have been observed to date. In 1959, we visited several schools in the Winchester area and requested that all nests be reported to us. Although several pupils told of finding nests previously, no nests were reported in 1959. This year, we publicized our request for nest locations in the Winchester and Chesterville papers and two nests were reported to us. Table II summarizes the information on the nests reported.

Haying in 1960 was late, due to very wet weather in May and unseasonably low temperatures in both May and June. The first field mowed was noted on June 16, but the peak of mowing did not occur until the first two weeks in July. Slightly less than 50 per cent of 80 hayfields observed between Winchester Springs and Kemptville had been mowed by July 12, 1960. Hayfield counts will be made in future to obtain accurate information concerning hay mowing. Since the data on the peak of the hatch and the main mowing period are similar to previous years, we can assume that nest losses from farming activities should have been about normal. Wet, cool weather probably caused the increase in re-nesting and late hatches.

The months of August and September 1960 were unusually hot and dry, and poor scenting conditions made the pre-season census difficult. The average

size of 36 coveys was 11.4 birds, compared to an eight-year average of 13.4 birds.

The season extended from September 24 to November 19. Most birds were harvested during the first week, and hunting pressure was the heaviest we have seen during the past five years. Greater interest in the Hungarian partridge has been shown locally, and more pointing dogs are appearing each year from the Ottawa area. We still consider that the partridge population could withstand much greater hunting pressure, and present hunter densities must still be considered light.

Birds were difficult to locate early in the season, and hot dry weather conditions probably had much to do with this. The partridge population was slightly smaller than in 1959; coveys may have been as numerous, but there were more small coveys and a greater percentage of young, immature birds than usual.

Although most parties considered Hungarian partridge shooting to be moderately good, hunting success did drop in 1960, as Table III indicates. Table IV summarizes 11 years of age ratios. Since 1950, 2,412 Hungarian partridges have been sexed and aged.

Our observations concerning smaller covey size in 1960 are borne out by the low ratio of juveniles to adults. The 1960 ratio of 2.64 is the third lowest in eleven years, and the second lowest if the meagre 1956 data are omitted. It compares with a 10-year average of 3.53. The very low ratio of 1.65 in 1953 preceded a partridge decline in 1955, and we hope that history does not repeat itself in this respect. It should be noted also that the 1960 ratio of juveniles to adult females is 6.45, about one-half the figure for this ratio during the past three years. The 10-year average is 8.47.



*Dr. C.H.D. Clarke, chief of Fish and Wildlife Branch, and District Biologist N.D. Patrick check age and sex of Hungarian partridges. Below: hunters at the alert as pointers and a Brittany spaniel point a covey in the stubble.*



